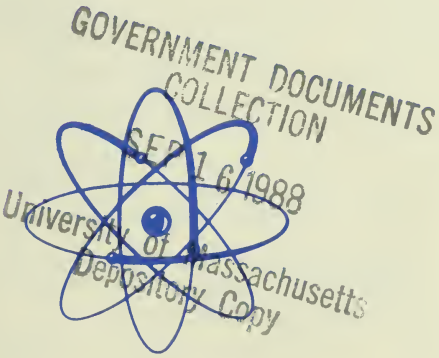
Massachusetts and The Nuclear Waste Policy Act of 1982



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Background

For more than thirty years, high-level radioactive waste has been accumulating at commercial power plants and on federally-owned sites. Inventories will exceed projected on-site storage capabilities by 1998. Some will reach their storage limit earlier. The amount of this waste will be increased by new power plants coming on line and by the process of decommissioning older plants in the years ahead.

Scientists have studied several methods for disposing of high-level waste (HLW). These include seabed disposal, polar ice cap disposal, rocketing waste into space, and disposal in stable rock formations deep underground, called geologic disposal. Based on these studies, the federal government has decided that geologic disposal of HLW can be accomplished the earliest with present available technology.

This booklet describes the federal government's plan for the disposal of high-level radioactive waste and Massachusetts' involvement in the process. It focuses on the U.S. Department of Energy's (DOE) direction in siting, constructing, and operating a mined geologic repository as required by the Nuclear Waste Policy Act of 1982 (NWPA).

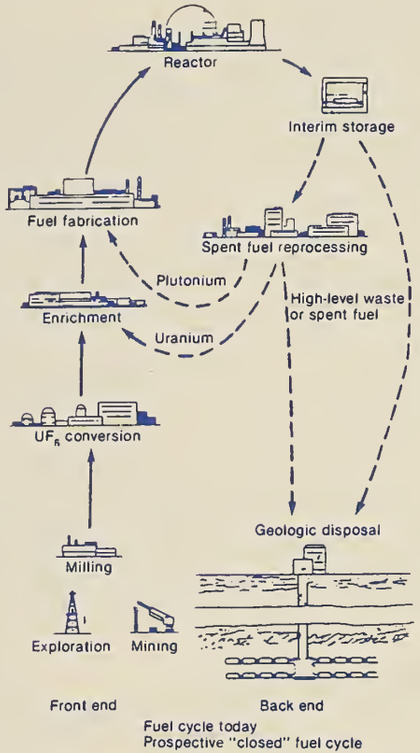
High-Level Waste

High-level waste (HLW) is the result of a long fuel cycle which begins with the mining of uranium ore.

HLW consists mainly of spent fuel rods that no longer contribute efficiently to a chain reaction in a nuclear reactor. HLW also includes liquid and solid wastes from the reprocessing of spent fuel to recover unused uranium and plutonium.

HLW emits radiation which could be harmful to humans or the environment without proper isolation and shielding.

HLW contain hundreds of radioactive isotopes that decay at different rates. Some decay in seconds, others remain radioactive for thousands of years. These isotopes need to be properly shielded and isolated until the radioactivity decays to levels that will pose no significant threat to people or the environment.



The Nuclear Fuel Cycle

The commercial nuclear fuel cycle includes activities for preparing and using reactor fuel and for managing spent fuel and other radioactive wastes produced in the process. It was originally intended that spent fuel be stored for 6 months in water-filled basins at reactor sites to dissipate thermal heat and allow decay of short-lived fission products. The spent fuel would then be reprocessed and the resultant liquid high-level waste solidified and disposed of in a Federal repository. Since no repository has been developed and no commercial reprocessing is being done, spent fuel will remain in storage until decisions about how to close the nuclear fuel cycle are made.

SOURCE: Council on Environmental Quality.

The Nuclear Waste Policy Act

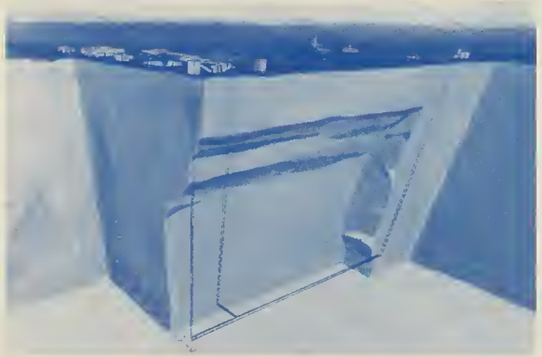
NWPA was passed by Congress in 1982. It establishes a schedule and step-by-step process in the siting and construction of geologic repositories for the disposal of HLW generated by nuclear reactors. NWPA requires DOE to site, construct, and operate geologic repositories for spent fuel and high-level waste. Initial operation for the first repository is scheduled for 1998.

Funding for the research and development of the repositories, and for state review of these activities, comes from a fee paid by utilities based on the amount of nuclear generated power they produce.

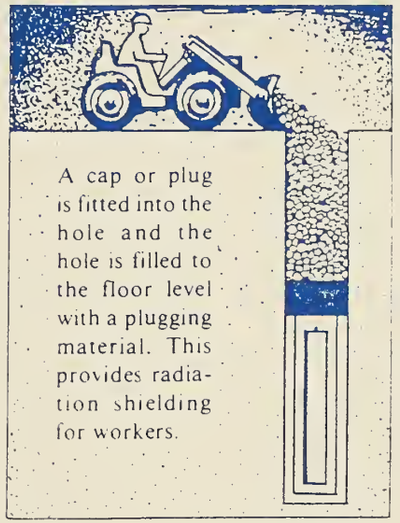
A Geologic Repository

A geologic repository will resemble a large mining complex. HLW received at the complex will be emplaced in disposal rooms 1,500 to 3,000 feet below the surface. Multiple barriers, both natural and man-made, will be used to isolate and contain the waste to prevent it from contact with the flow of groundwater. If the groundwater comes in contact with the waste, radionuclides will be transported from the waste to surface water.

Surface operational facilities will cover 400 acres. The underground area of the repository will cover approximately 2,000 acres. A control zone between 10,000 to 20,000 acres will surround the repository.



When the waste arrives at the repository, it will be unloaded and inspected. The waste will then be lowered down a shaft to transport trucks that will carry the waste packages to burial corridors. The trucks will then deposit the waste package into holes drilled into the corridor floors. The holes will be capped and filled with a plugging material to provide radiation shielding for workers. When the holes are filled, the shafts will be plugged, backfilled, and sealed.



The disposal capacity for the first repository will be limited to 70,000 metric tons until a second repository becomes available.

The Crystalline Repository Project

At the time NWPA was enacted, DOE was already studying several different sites for geologic and hydrologic characteristics favorable to hosting a repository. Draft environmental assessments have identified three candidate sites for the first repository. These sites are Yucca Mountain in Nevada, Deaf Smith County in Texas, and Hanford, Washington.

Those sites not selected for the first repository will remain potential host sites for the second repository. In addition, DOE is studying 236 crystalline rock formations in 17 states to identify potentially acceptable sites for a second repository. This program is called the Crystalline Repository Project.

Massachusetts is one of the crystalline rock states. DOE has identified 17 rock formations in the Commonwealth for investigation because they meet two criteria — they extend to a depth of at least 1,000 feet below the surface, and they are a minimum of 39 square miles.

Crystalline Rock Bodies of Massachusetts

DOE is studying environmental and geologic factors of the 236 rock bodies during the regional phase of the Crystalline Repository Project. In late 1985, a report will be issued identifying 15 to 20 candidate sites that will undergo field testing in the area phase. The area phase is scheduled to begin in September 1986.

Milestones for the Second Repository

NWPA directs DOE to nominate five sites determined suitable for a second repository no later than July 1989. At least three of the sites will be from the Crystalline Repository Project. The other two sites could come from the Crystalline Repository Project or the two sites which were characterized but not selected for the first repository. Shortly thereafter, DOE will recommend three of these sites for detailed hydrogeologic testing. In the mid-1990's, the President will select one site for the second repository, which is expected to accept high-level waste in the year 2006.

Conclusion

The Nuclear Waste Policy Act allows for states and interest groups to review decisions made by the Department of Energy. The Radiation Control Program of the Massachusetts Department of Public Health has been designated by the Governor to work with the Department of Energy in the exchange of information concerning the Crystalline Repository Project.

There are numerous issues involved in the quest for a permanent geologic repository, including transportation, interim storage, and post-closure. The Radiation Control Program will continue to monitor these issues in order to keep public officials and citizens in touch with developments in the program.

For more information, write or call:

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